

which timely warnings were issued beginning for the northwestern portion of the district on the morning of the 17th; they were extended over the interior of the district at 8 p. m. of the 17th, and to the Gulf Coast on the morning of the 18th. The temperatures predicted for the different parts of the district occurred almost exactly as forecast.

Moderate cold waves occurred over the northern portion of the district on the 21st, 22d, and 29th, for which warnings were issued. No cold wave occurred without warning.

Moderate storm winds occurred on some portion of the West Gulf coast on the 6th, 12th, 15th, 16th, 18th, and 19th. Warnings were issued for some portion of the coast as follows: Small-craft warnings on the 3d, 11th, 15th, 17th, 18th, 20th, and 21st; storm warnings on the 6th, 11th, 14th, 15th, and 18th. Warnings were issued for all storm winds except at Galveston and Port Arthur on the 6th.

Fire-weather warnings were issued for Arkansas and Oklahoma on the 3d, and for Arkansas on the 14th and 18th.—*I. M. Cline.*

#### DENVER FORECAST DISTRICT.

The month was cold and stormy, with an excess in precipitation in about all of the district, except the extreme southern portion.

On the morning of the 3d, when a disturbance of marked intensity was central over southeastern Colorado, warnings of heavy snow and much colder weather were issued to stockmen in eastern and southern Colorado and northwestern New Mexico. Light snow occurred throughout the region indicated, attended by a sharp fall in temperature that amounted almost to a cold wave.

Live-stock warnings were issued on the morning of the 9th to interests in southwestern Colorado, northwestern New Mexico, northeastern Arizona, and southern Utah, when heavy snow was expected to attend a low of considerable intensity that was central over southern Nevada. Moderately heavy snow occurred in southwestern Utah during the night of the 9th–10th, and light snow fell in the remainder of the region in which warnings were distributed.

A cold-wave warning was issued for north-central Arizona on the morning of the 10th. Although an area of decidedly low pressure which was central near Flagstaff moved rapidly eastward, a fall in temperature of only about 10 degrees occurred at that station.

Warnings of a moderate cold wave, issued on the 14th for southwestern Colorado, extreme northwestern New Mexico, northeastern Arizona, and extreme southeastern Utah, were justified, the temperature falling 16° to 20°, and to minima of 14° to 16°, over the area included in the warnings. Warning of a moderate cold wave for southern and extreme eastern New Mexico, issued on the evening of the 14th, was also justified, the fall in temperature east of the mountains in that State amounting to from 20° to 34°, with minimum temperatures at Santa Fe and Roswell of 8° and 22°, respectively, on the morning of the 16th.

Warnings of snow and a severe cold wave in eastern Colorado, and of snow and a moderate cold wave in northeastern New Mexico, including stockmen's warnings in eastern Colorado, were issued on the morning of the 17th, when a low of unusual intensity extended from the Southern Plateau States to the Upper Lakes, with its center over northeastern Colorado, while much higher pressures and severe cold weather prevailed over the sec-

tions to the northward. Cold-wave warnings, based upon 4 p. m. special observations, were extended to southeastern New Mexico on the afternoon of the 17th and were repeated on the evening of that date, when temperatures considerably below freezing were forecast for extreme southeastern New Mexico by the following morning. Moderately heavy snow fell in eastern Colorado during the afternoon and night of the 17th, with a severe cold wave overspreading northern and eastern Colorado by night and extending to extreme southeastern New Mexico by the morning of the 18th, when the temperature was below zero in northeastern Colorado and was but 16° above zero at Roswell, N. Mex. The fall in temperature in eastern Colorado amounted to from 34° to 40° during the 24 hours ending at 8 p. m. of the 17th, and at Roswell to 36° during the 24 hours ending at 8 p. m. of the 18th.

On the evening of the 20th, when an area of low pressure extended from southern California northeastward to the Upper Lakes, with its center near Pueblo, where the barometer had fallen to 29.22 inches, warnings of a moderate cold wave were issued for eastern Colorado and southeastern and extreme northeastern New Mexico. The fall in temperature during the following 24 hours amounted to from 20° to 36° over the region specified, with the minimum temperature on the morning of the 22d ranging from 4° at Cheyenne to 26° at Roswell.

Warnings of a moderate cold wave were issued on the morning of the 21st for northern and eastern New Mexico, with live-stock warnings for the northeastern portion of that State, due to expected snow and strong northerly winds. The cold-wave warnings were fully justified, as already indicated, with strong winds and rain, turning to light snow, in northern New Mexico during the 21st and the night of the 22d.

A cold wave, without warning, occurred at Grand Junction, Colo., on the 18th, and at Durango, Colo., on the 22d.

Frost warnings were issued as follows: 4th, extreme southern New Mexico and southwestern Arizona; 5th and 6th, extreme southern New Mexico and southern Arizona; 10th, 11th, and 14th, south-central New Mexico and southern Arizona; 12th, south-central New Mexico and south-central and southeastern Arizona; 15th, 21st, and 22d, southern Arizona; 16th and 23d, southern New Mexico and south-central and southeastern Arizona; 18th, southern Arizona; 19th, south-central and southeastern Arizona; 25th, 27th, and 30th, southern New Mexico; 31st, extreme southeastern New Mexico. These warnings were generally verified.

The following freezing-temperature warnings were also issued: 16th, 23d, and 26th, extreme southeastern New Mexico; 18th, south-central and southwestern New Mexico; 19th and 22d, southern New Mexico. All of the foregoing warnings were verified at Roswell, El Paso, or the fruit-frost stations in southern New Mexico, except that of the 26th, the lowest temperatures on the morning of the 27th being 36°.—*J. M. Sherier.*

#### SAN FRANCISCO FORECAST DISTRICT.

The dominant feature of March weather in this district was the persistence of a large and energetic area of high pressure off the northern coast. This condition deflected the storms from the north Pacific eastward at a high latitude, confined the areas of precipitation mostly to the western portions of Washington and Oregon, and caused a drought over the southern portion of the Pacific Slope.